PENNGRADE®
HIGH PERFORMANCE OIL

The Original Green Oil®

PENNGRADE 1®
VS.
COMPETITORS

PENNGRADE 1®:
PERFORMANCE
ENGINEERED LUBRICANTS

MADE IN USA

D-A® LUBRICANT COMPANY

PENNGRADE®
HIGH PERFORMANCE OIL

PENNGRADE 1® VS. COMPETITORS

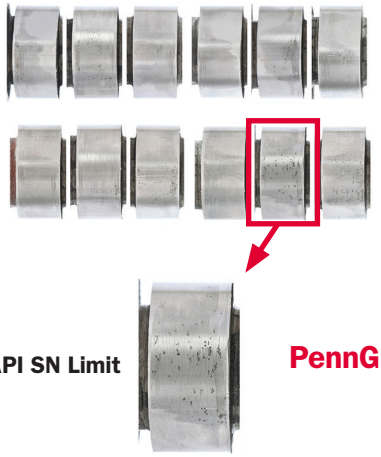
PennGrade 1®
High Performance Oil.

"The Original Green Oil®"
is developed to protect. It's designed for racing, classic, historic, vintage, hot rod and muscle car engines.

PennGrade 1® Technology delivers:

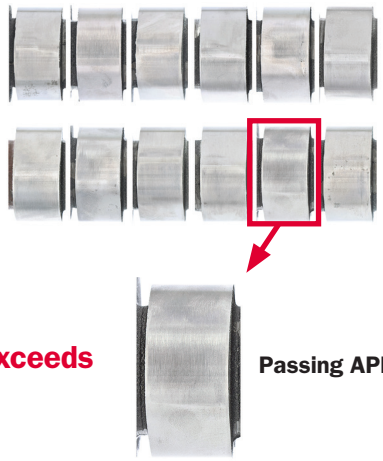
- Superior wear protection through its enhanced levels of anti-wear components
- Excellent deposit control through tailored detergents and dispersants chemistry
- Strong film strength and protection
- Stability at high temperatures through its use of anti-foam
- Reduced internal friction by use of friction modifiers
- Robust anti-oxidant system maintaining low viscosity and reducing oxidation

CAM LOBE WEAR



Failing API SN Limit

PennGrade 1® Technology exceeds API SN performance.



Passing API SN Limit

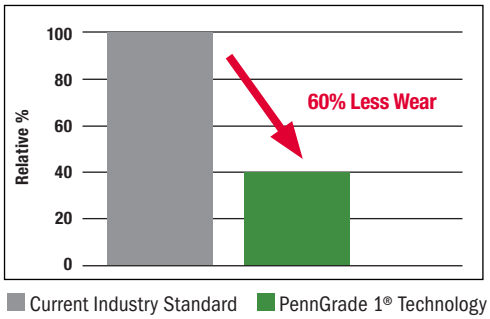
VALVE TRAIN ROLLER FOLLOWER WEAR

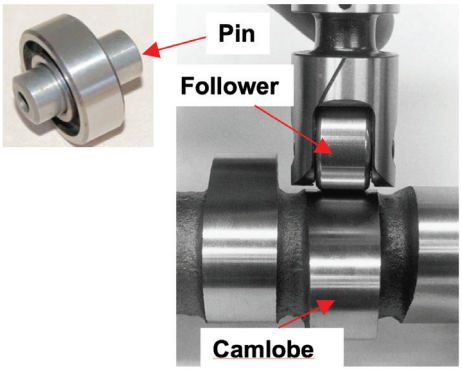
RFWT (ASTM D5966)

- Current industry standard (API CK-4) diesel engine test.
- Evaluates a lubricant's ability to prevent wear on roller follower axles.

Test Conditions:

- Measurement: 16 rollers are measured for wear and the average is reported.
- Engine: General Motors 6.5L, indirect-injected V8 diesel engine.
- Parameters: Operates at low speed and heavy engine torque for 50 hours.





PennGrade 1® technology delivers 60% less wear in the valve train roller followers than required by a current industry standard diesel engine test.*

**Based on testing of PennGrade 1® technology 10W-30 in Roller Follower Wear Test (RFWT) (ASTM D5966) as required by API CK-4 spec.*

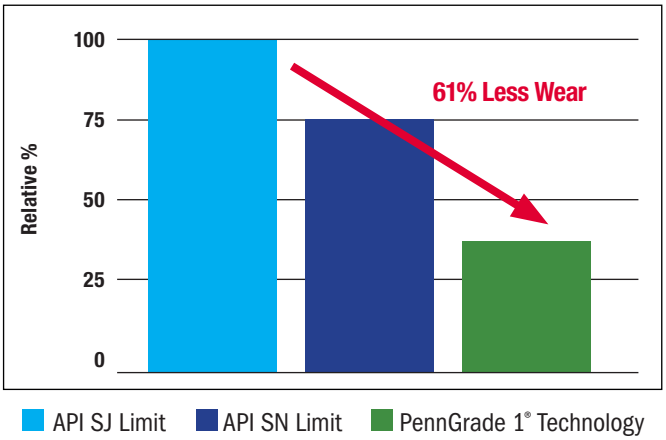
PENNGRADE® HIGH PERFORMANCE OIL

PENNGRADE 1® VS. COMPETITORS (cont'd)

SEQ. IVA: CAMSHAFT LOBE WEAR

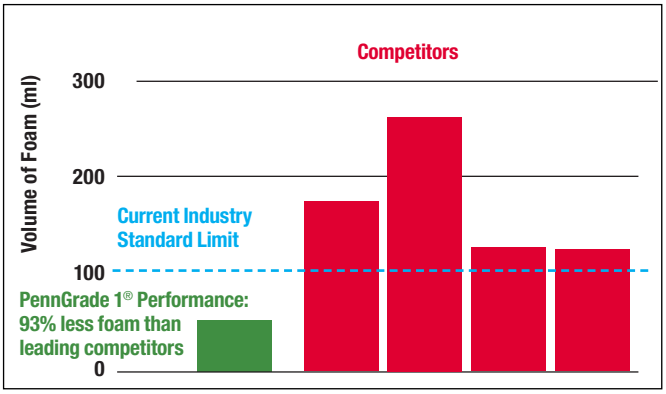
PennGrade 1® technology delivers 61% less wear in the camshaft than required API SJ limit.*

**Based on testing of PennGrade 1® technology 5W-30 in Seq IVA (ASTM D6891) as required by API SJ Spec.*

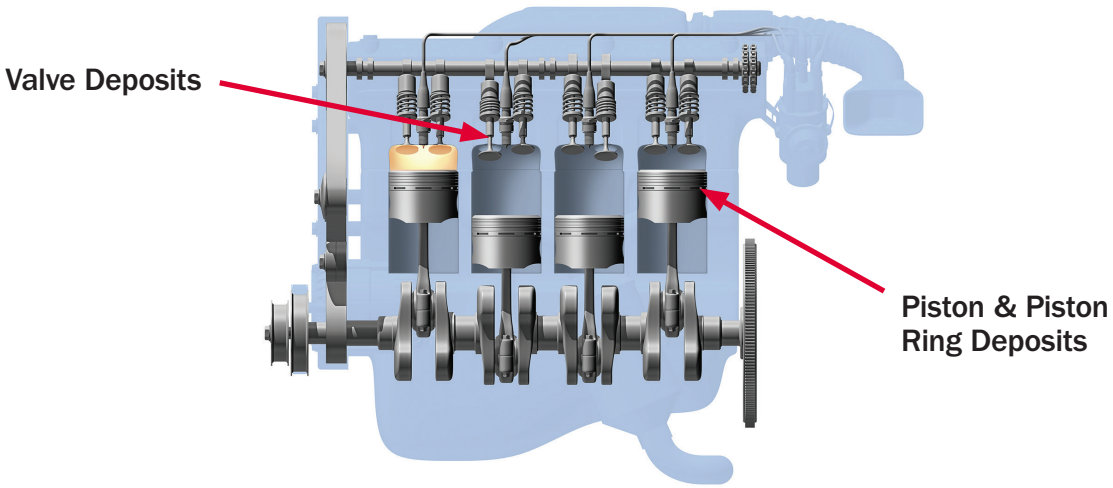


SEQ. V: HIGH TEMPERATURE FOAM

PennGrade 1® 20W-50 racing oil delivers least amount of foam at high temperatures compared to the 4 leading competitor racing oils. Based on testing SEQ. V: High Temperature Foam.



DEPOSIT CONTROL



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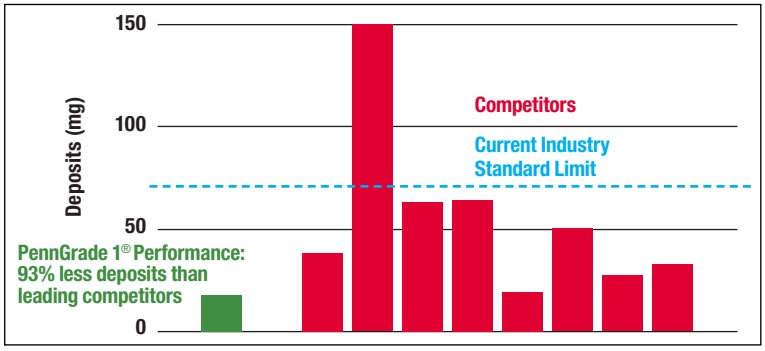
PENNGRADE 1® VS. COMPETITORS (cont'd)

COMBINED DEPOSITS - TEOST 33C & MHT-4

- TEOST 33C: Evaluates a lubricant's ability to control deposits in the high temperature turbocharger area.
- TEOST MHT-4: Evaluates a lubricant's ability to control deposits in the ring belt and piston ring areas of the engine.
- The ability of PennGrade 1® to limit the formation of deposits across the entire engine leads to reduced wear.



PennGrade 1® 20W-50 racing oil delivers the least amount of combined deposits when tested against 8 leading competitor racing oils in the TEOST 33C and TEOST MHT-4 tests.

Deposit Buildup → **Increases Friction** → **Engine Works Harder & Decreases Output** → **Increases Fuel Consumption**

SEQ. IIIG: PISTON DEPOSITS

Failing API SN Limit

Passing API SN Limit

Exceeding API SN Limit, Equivalent to PennGrade 1® Technology

PennGrade 1® Technology exceeds API SN performance.

PENNGRADE 1®: A WELL BALANCED FORMULATION

TEST	PennGrade 1®	Competitor 1	Competitor 2	Competitor 3	Competitor 4	Competitor 5	Competitor 6	Competitor 7	Competitor 8
TEOST (ASTM D6335)	Pass	Fail	Fail	Fail	Fail	Pass	Fail	Pass	Pass
TEOST MHT-4 (ASTM D7097)	Pass	Pass	Fail	Pass	Pass	Pass	Pass	Pass	Pass
PDSC (CEC L-85-T-99)	Pass	Pass	Fail	Pass	Fail	Pass	Pass	Pass	Pass
FOAM SEQ I 24C (ASTM D892)	Pass	Pass	Fail	Pass	Pass	Pass	Pass	Pass	Pass
FOAM SEQ II 93C (ASTM D892)	Pass	Pass	Fail	Pass	Pass	Pass	Pass	Pass	Pass
FOAM SEQ III 24C (ASTM D892)	Pass	Pass	Fail	Pass	Pass	Pass	Pass	Pass	Pass
FOAM SEQ IV 150C (ASTM D6082)	Pass	Fail	Fail	Fail	Pass	Fail	Pass	Pass	Fail